

eeBuildings' Low-Cost and No-Cost Improvements Yield High Returns

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eeBuildings works in major developing cities, such as Shanghai.

The next article in this three part series will be featured in our October issue it will explore specific low-cost/no-cost measures that can be taken to produce energy savings of up to 20 percent, and a third article in December/January will offer several exemplary case studies of how some of Shanghai's high profile office buildings have experienced energy savings of 15-20 percent from the implementation of low-cost/no-cost measures.

Conserve energy, save money and "green" your building with little or no first cost—that is the vision of eeBuildings, an international initiative of the US EPA.

Many commercial building owners and managers understand the financial and environmental benefits of improving their buildings' energy efficiency, but lack the tools necessary to make appropriate changes. eeBuildings supplies the necessary resources to individual building owners and managers and to large international property management firms to improve energy-efficiency and reduce utility costs by up to 20 percent.

eeBuildings was developed by the U.S. Environmental Protection Agency (EPA) to share lessons learned from the U.S. ENERGY STAR national energy-efficient buildings program. ENERGY STAR's 13,500 participating organisations in the commercial sector (19 percent of the commercial building square footage in the U.S.) have saved more than US\$4.3 billion annually. Together, these buildings have prevented over 17.8 million metric tons of carbon from being released into the atmosphere, which is equivalent to removing 15 million cars from the road.¹

eeBuildings works with building owners, property managers, engineers, government agencies and others to improve commercial building energy efficiency.

Assistance is provided through training and guidance on how to assess and respond to opportunities to improve energy efficiency quickly and at low cost or no cost. The program was initiated in Asia and Latin America in 1997 and its China program started in 2001 in Shanghai. In China, training has been provided to 1067 property managers and other building experts, and 20 property management companies have partnered with eeBuildings. In addition, eeBuildings has provided targeted assistance to various local and national government agencies responsible for promoting energy efficiency in commercial and public buildings.

The program receives all of its financial support from the EPA, and always provides its services at no charge to its partners around the world.

eeBuildings' unique approach

eeBuildings is based on the concept that the fastest, least-costly, and most significant reductions in energy use can be achieved by simply improving the operations and maintenance (O&M) of the building's existing systems.

understanding the commercial building sector

eeBuildings' unique approach to energy efficiency takes into account the top priorities of property owners and managers. Through its experience working with hundreds of buildings in many countries, eeBuildings has a well-developed understanding of the concerns of building owners and managers, including security, tenant retention, leasing space,

profitability, maintenance, and insurance, among others. The program recognises that energy efficiency may not be their top priority, and they may not understand the potential for energy efficiency to help them improve tenant comfort and improve the financial performance of their buildings.

For example, eeBuildings' energy-efficient methods do not compromise tenant comfort. In fact, tenant comfort will often be improved by applying better control and appropriate levels of lighting, cooling, and air circulation. Such improvements to the indoor environment by the building owner or the manager can create a reputation for O&M excellence, which attracts new tenants.²

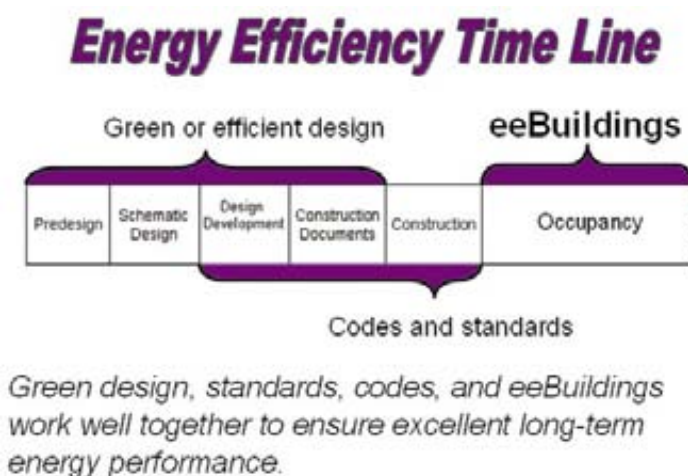
an attractive strategy

eeBuildings promotes understanding of how building managers can implement low-cost/no-cost measures that are affordable, low-risk investments with significant returns. Because so many buildings in fast-growing Asian cities are relatively new, building managers and owners are often hesitant to invest in new or replacement energy-efficiency technologies for these buildings. eeBuildings provides affordable operational measures that avoid costly capital improvements, and help get both older and newer systems working as originally intended.

The program motivates a long-term commitment to energy efficiency, overall building maintenance and tenant satisfaction. Initial energy savings encourage a more aggressive approach to maintaining higher standards of performance in the future. eeBuildings supports partners' success by connecting its partners with others who share similar objectives of sustainability and energy efficiency, and keeping them informed of new projects, successes, and opportunities via their periodic newsletter and website.

community benefits

eeBuildings advocates strategies that can not only provide savings to building owners, but also help to decrease local and regional energy use and prevent pollution. With many rapidly-growing cities experiencing blackouts, energy price increases, and higher peak energy demand, efficient energy use is essential to economic growth. Consequently, several of eeBuildings' municipal and national government partners have partnered with eeBuildings to provide assistance to the commercial building sector in recognising opportunities for savings that help lead to peak demand reductions and reduced pollution.



targeting energy consumption

Often, 50 percent of a commercial building's energy consumption is wasted. Of this waste, half is due to specific management practices and half is due to inefficient building systems. eeBuildings works on the former by helping its partners improve O&M practices.

Through simple, incremental adjustments to management practices, buildings can achieve immediate savings. For example, reprogramming Building Automation Systems (BAS) to more effectively control lighting can generate substantial savings. Lighting alone can total up to a quarter of an office building's energy bill³, and adjusting the intensity or duration of a building's light system's operation can produce substantial savings. Similarly, using night pre-cooling in appropriate conditions can reduce the electricity required for indoor air conditioning, and optimising the pressure balance in buildings can avoid infiltration and loss of conditioned air.

field testing energy efficiency strategies

The eeBuildings initiative benefited from U.S. studies of commercial buildings, which suggested that the overall efficiency of energy use in commercial buildings has a more significant relationship to a building's management practices than to the technology and design of a building. eeBuildings drew on this finding, and other lessons on how to deliver effective strategies to the commercial sector for supporting voluntary energy efficiency gains that were developed within the U.S. ENERGY STAR program. eeBuildings sought to bring experience to international markets by first testing the effectiveness of its emerging strategies in a specific market.

In Shanghai, eeBuildings worked intensively with a small group of buildings to identify and field-test a number of specific measures. This included activities such as inspecting major energy-using equipment, reviewing the buildings' automated control systems, and in-depth interviews with building operations staff regarding specific management practices. These findings were incorporated into a set of recommended practices that have been used to assist other buildings in Shanghai and elsewhere.

working in new markets

eeBuildings has developed a strategy for working with new partners in several cities in China and other countries in Asia. A typical eeBuildings engagement begins with eeBuildings experts visiting a number of buildings, commercial real estate management firms, and technical service providers to learn about prevailing management practices, typical building systems and other unique factors of the particular market.

eeBuildings will then work with interested partners to understand the types of low-

cost and no-cost energy efficiency opportunities that may be possible in their facilities (or in their client's facilities), assist them in evaluating the most promising opportunities, and publicise the success of partners as they implement different measures.

As a service to its partners, eeBuildings offers the development of case studies that showcase a partner's efforts. These case studies are developed in a brief and motivational format that can serve as a powerful marketing tool for partners and are also useful for training purposes.

eeBuildings conducts training sessions for city-wide partners; here the Shanghai Refrigeration Society attends a training session.



Here eeBuildings conducts preliminary trainings with Tongji University Students.



recent eeBuildings experience

eeBuildings has delivered assistance to a variety of partners in several countries in recent years. Since 2000, eeBuildings has worked with a number of large commercial office facilities in Shanghai, including clients of many property management firms operating in that market. In addition, training has been provided to the Association of Shanghai Property Managers (ASPM), the Shanghai Society of Refrigeration Engineers, Shanghai Normal University and Tongji University.

In addition, students from the Tongji University facility management program have interned with eeBuildings partners in Shanghai. In 2004, the students were trained to assist in evaluating three partner buildings; subsequently the students continued to aid the implementation of low-cost and no-cost measures and the monitoring of the buildings' improvements. Tongji students were able to work with managers on low-cost

and no-cost measures on-site to gain hands-on training. Students were challenged to organise and track data to document program successes. In return for developing their skills and experience, the students helped facilities managers generate energy savings. Students gained valuable experience that will expand their future job opportunities.

As a result of its work in Shanghai, the program entered into a new partnership with the Shanghai Energy Conservation Supervision Centre (SECSC), a municipal organisation that works with the commercial building sector to improve operating efficiency and reduce peak demand in Shanghai. eeBuildings trained members of SECSC's technical and sector outreach staff, and also assisted SECSC in the development of specific technical guidance for several hundred major commercial buildings in Shanghai for reducing building energy use during summer peak demand periods.

around China

In 2005, the program began working with the Jiangsu Energy Conservation Centre (JECC) to provide training and technical assistance to buildings in the provincial capital of Nanjing. An inaugural training for commercial facility managers in Nanjing will occur in late 2005.

Also in China, eeBuildings has entered into a partnership with the Government Offices Administration (GOA), a national-level organisation responsible for managing more than 10 million sqm of government-owned office space. eeBuildings provided technical training to 100 senior GOA managers in early 2005, and subsequently trained more than 100 facility managers in July 2005. The program is currently working with the GOA to develop additional training for more facility managers, and to document successful implementation of low-cost and no-cost energy efficiency measures in buildings it manages.

New programs with several major commercial property management companies, industry associations, and facility managers in individual buildings have been initiated in India (Mumbai) and Taiwan (Taipei). Most recently, the program has entered into discussions with groups in Singapore with initiatives beginning as early as late 2005. The eeBuildings team will be reaching out to its regional property management and technical partners in Singapore as that new effort commences.



The USEPA eeBuildings' website features a case study of the Jin Mao Tower; it reduced energy use by 20 percent through low-cost/no-cost operational and retrofit measures.

Note:

¹ ENERGY STAR Data. 10 August 2005

² Recent studies have suggested that energy efficiency measures may provide additional benefits for tenants -- and actually increase employee productivity, reduce the number of employee absences, reduce errors and allow for better quality work. One study suggests that an energy-efficient work environment can create productivity gains as high as 16 percent (Romm, Joseph. Greening the Building and the Bottom Line: Increasing Productivity Through Energy-Efficient Design).

³ US Department of Energy Information Administration, September 1994. Lighting 22 percent, water heating 4 percent, ventilation 11 percent, cooling 7 percent, space heating 29 percent, office equipment 13 percent, refrigeration 3 percent, cooking 1 percent, other 10 percent.